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ABSTRACT

A 50-item, five-point Likert scale inventory was designed to be a valid and reliable group-administered instrument to provide a profile of the declarative knowledge of electronic mail (e-mail) strategies used by students learning English as a second language (ESL) or foreign language (EFL). The inventory was developed primarily for voluntary use by ESL/EFL teachers. The Strategy Inventory for E-mail Writing (SIEW) is in questionnaire form and has four strategy subscales: cognitive; metacognitive; social; and affective. This report describes the development and pilot testing of the SIEW with two groups (n=51 and 208 college ESL students, respectively), and presents results. Implications for classroom ESL/EFL instruction and for incorporation of learning and writing strategy instruction are examined. The instrument is appended. (Contains 14 references.) (MSE)

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STRATEGY INVENTORY FOR E-MAIL WRITING

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Strategy Inventory for E-mail Writing (SIEW) by Yu-Chih, Sun, 1999.

DESCRIPTION: A 50-item, 5-point Likert Scale inventory was designed to be a valid and reliable group-administered instrument that would provide a profile of the declarative knowledge of e-mail writing strategies used by students learning English as a second language (ESL) or English as a foreign language (EFL). The inventory was developed primarily for voluntary use by ESL/EFL teachers.

ADMINISTRATION: The SIEW is in questionnaire form and may be individually or group administered in approximately 20 minutes.

SCORING AND INTERPRETATION: The SIEW has four subscales: cognitive strategies, metacognitive strategies, social strategies, and affective strategies. Items are weighted from 1 (rarely) to 5 (always). Hand or machine scoring may be used for ratings by having subjects circle appropriate numbers assigned to responses. Medians are used to denote average item and scale ratings.

TECHNICAL INFORMATION: Technical data are provided based on a study conducted using this questionnaire, including reliability and validity.

MATERIALS: Paper, Strategy Inventory for E-mail Writing (SIEW), including questionnaire items.

INTRODUCTION

The learning strategies used by language learners have been considered as crucial predictors of the success in language learning (Oxford, 1990; O'Malley & Chamot, 1990). Research shows that good language learners tend to use more learning strategies than do poor language learners (Oxford, 1989; Green, 1995) and they are also more insightful about the strategies that they use and why they use them (Wesche, 1979). Therefore, through in-depth understanding of the second language learning process and strategy use, it can help students improve their use of learning strategy and make the language learning process more effective. In addition, the strategies used by students should also be identifiable by classroom teachers in order for them to orient their curriculum design and instructional method to suit various needs of the students. For these reasons, a study concerning the learning strategies used by ESL/EFL learners in various situations are in great demand, especially, for those areas where new learning behavior and process are required due to different learning environment, such as computer-mediated communication (CMC).

With the advent and wide spread use of Internet, e-mail has become an important medium for language learning and teaching, especially, for ESL and EFL students because it offers some unique features that is impossible in the traditional classroom. For example, e-mail allows learners to communicate with an authentic audience from different parts of the world in a purposeful and timely fashion (Warschauer, 1996; Suozzo, 1995; Schwartz, 1990). For language testing, the assessment of writing skills in traditional classroom tends to base on mechanical skills such as spellings, grammar, and use of forms. However, in an e-mail environment, the criteria for assessment is more holistic, primarily focusing on the fulfillment of communication purpose (Warschauer, 1995). Therefore, effective e-mail communication requires different writing strategies from traditional classroom settings. Even though e-mail has been well-received by language learners and teachers, very few research, if any, tried to identify how students go about writing e-mail messages and what strategies they tend to use in the process.

Although other researchers have developed measures of writing strategy knowledge, they are not well suited to large-scale studies in the e-mail settings for a variety of reasons. First, some researchers have used detailed interviews to obtain information on students' writing strategy use (Rubin, 1975; Vann & Abraham, 1990), while this technique allows for detailed probing of students' writing strategies, it is quite time consuming. Second, as mentioned earlier, the writing environment in the e-mail setting is very different from that in the traditional writing

classroom, the nature of Internet that fosters purposeful communication and authentic audience does change the dynamic of students' involvement in the writing process. However, most measures have concentrated on writing strategies in the traditional classroom situation. No group measure is currently available that asks ESL/EFL students to rate their frequency use of the writing strategies in their e-mail writing process.

In response to these problems, the researcher constructed and tested the Strategy Inventory for E-mail Writing (SIEW). The goals were to develop a reliable and valid survey that (1) would be administered to ESL/EFL students in a group setting, (2) would provide a profile of ESL/EFL students' use of writing strategies in the e-mail environment, and (3) would show good external and discriminative validity, indicating that the dimensions of the scale were psychological meaningful. Further studies can then examine the relation of the information concerning students' use of writing strategies and learning outcomes and the conditions under which students engage in the e-mail writing.

METHODS

Subjects

Two sample groups participated in the study. The first group of subjects was 51 ESL students in a mid-west university in the United States and they participated in the initial scale construction for pilot test and reliability test.

The other group of subjects were 208 ESL college students who were enrolled in 16 different ESL programs in academic settings in the United States where e-mail was incorporated into their writing classrooms. The second group of subjects were located by sending messages requesting participants to ESL teachers via listserv discussion groups such as Neteach-L, TESL-L, TWO-L, ED-NET, IECC-Discussion, and writing to conference presenters in the TESOL convention as well as book contributors of Virtual Connection. Questionnaires were then sent to those ESL teachers who agreed to participate in the study. Of the 208 subjects, 55% of the sample was male with 45% female. 32% was enrolled in language school, 40% was undergraduate students, and 28% was graduate students. 80% of the sample was Asian mainly coming from China (28%), Taiwan (7%), Japan (16%), Indonesia (4%), Thailand (3%), Korea (14%), and Arabic (9%). The project was approved by the Human Research Review Committee at the University of Kansas and was implemented based on the requirements specified in the regulations.

Instrument Development

The initial step taken in developing the SIEW involved the collection of short statements of specific behaviors exhibited by classroom teachers and students. Sources included extensive literatures on second language learning strategies, ESL writing strategies, and computer-mediated communication (CMC) that provided a wealth list of both effective and less effective e-mail writing strategies from which an initial pool of items was developed. Next, the selected strategies were categorized into the following four psychometric subgroups:

COGNITIVE STRATEGIES

Cognitive strategies are skills that involve manipulation or transformation of the language in some direct way, such as reasoning deductively or contrastively across languages, analyzing expressions, formal practice with structures and sounds, and functional practice in naturalistic settings (O'Malley & Chamot, 1990; Oxford, 1993; Oxford, 1989a).

METACOGNITIVE STRATEGIES

Metacognitive strategies are those that help learners control their cognition through planning, arranging, focusing, and evaluating their own learning process, through overviewing, paying attention, seeking practice opportunities, self-monitoring, etc. (Oxford, 1989a; Oxford, 1993; O'Malley & Chamot, 1990).

AFFECTIVE STRATEGIES

Affective strategies are techniques that enable learners to control feelings, motivations, and attitudes related to language learning, such as self-reinforcement and discussing one's feelings with someone else (Oxford, 1989; Oxford, 1993; O'Malley & Chamot, 1990).

SOCIAL STRATEGIES

Social strategies are actions that involve other people in the language learning process. Examples are asking questions for verification, asking for correction, cooperating with peers, developing cultural understanding, and empathizing with others (Oxford, 1989; Oxford, 1993; O'Malley & Chamot, 1990).

Any such classification inevitably has fuzzy boundaries but, in general, it is a useful way of showing the extent to which the SIEW has ample coverage of strategies in various aspects of e-mail writing behavior.

Self-report questionnaire format was chosen as a data-collection instrument in this study because (1) it enables the researcher to collect data from a large group of subjects, (2) it yields responses which can readily be quantified and analyzed, (3)

it allows sampling of various kinds of writing strategies which learners use for different types of language tasks, and (4) it can easily be adopted by classroom teachers and the results can serve as a valuable reference for the teacher's curriculum and instruction design.

The SIEW questionnaire was designed to assess the frequency with which learners use various writing strategies. It is a self-report 5-point Likert scale with 50 items. Respondents must rate their frequency of use of e-mail writing strategy, ranging from (1) never, (2) rarely, (3) sometimes, (4) usually, to (5) always. Efforts were made to minimize the possibility that students would give socially desirable answers, by implementing anonymity of the survey and the inclusion of reverse-coded questions. The items scored in reverse were numbers 9, 42, 44, 48, and 50. I added all items together to get a total score. The possible range for total scores was 50 (least use of strategies) to 250 (most use of strategies).

Pilot Testing

Two pilot tests were performed before conducting the formal survey in order to identify the problematic items, verify the reliability and validity of the instruments and solicit feedback from professionals, writing teachers, and ESL students for items modification and revision.

PILOT TEST ONE

The purpose of the first pilot study was to find out whether questions put forward to the students and teachers actually solicited the intended information for the study. In addition, the following objectives were accomplished, (1) to ensure that the terminology and intent of each questionnaire item is understood by every respondent, (2) to solicit suggestions to improve the questionnaire, (3) to determine the amount of time required to complete the questionnaire, (4) to determine the proper information sought for the study, (5) to identify possible problems that might occur when questionnaires are administered to the subjects, and (6) to determine the efficiency of the scoring method of the collected data.

For the first pilot study, opinions concerning the content of the questionnaire were solicited from dissertation committee members, professors in related fields, ESL teachers, statisticians, ESL students, and ESL professionals on Internet discussion groups by posting questions requesting for comments on classroom practice of e-mail writing. Data was collected through face-to-face discussions, postal mailing exchanges, e-mail, web page correspondence, or phone discussions. Appropriate revision of the questionnaire was made based on the suggestions and comments solicited from the first pilot test.

PILOT TEST TWO

After the revision of the questionnaire during the first pilot test, the purpose of the second pilot test was aimed to test the reliability and validity of the instrument to ensure that the questionnaire was valid and reliable. For reliability test, the preliminary version of the questionnaire was administered to 51 ESL volunteers in a mid-west university in the United States. Data was collected through sending SIEW questionnaire to participants via postal mail or e-mail. The result of the reliability test on SIEW shows adequate internal consistency of .90 with Cronbach alpha coefficient based on the data collected from the above mentioned 51 subjects in the study. The content validity of this survey was examined by having two experts blind match each questionnaire item with its original subscales of item development. Some problematic items are either discarded or rephrased to enhance the content validity of the instrument. The report content validity of SIEW was .94, which is also considered to be very high.

Questionnaire Administration

A request for research participants was sent via e-mail to ESL discussion lists and the following information was solicited from the participating teacher, including class size, level of the class, title of the class, class schedule and contact information of the participating teacher such as name, mailing address, e-mail address, and phone number. The revised questionnaires (see Appendix I) were then sent to 16 participating ESL teachers in early November, 1998 because both student and teacher were expected to have gained enough experience in e-mail writing by that time. The whole sets of questionnaires were mailed to the corresponding teachers together with a cover letter specifying the nature of the study, how the data would be utilized, estimated amount of time to complete each part of the questionnaire, and instructions on how to administer the questionnaire. A self-addressed stamped envelope and consent form were also provided in the package.

RESULTS

The quantitative analysis of the data was done by using the Statistical Package for Social Science (SPSS) 8.0 for Windows. The primary statistical techniques used in this research included (1) descriptive analysis, (2) reliability test, and (3) principal component factor analysis.

Descriptive Analysis of Item Frequencies

Initial data analyses involved comparing mean item scores and response frequencies within each previously identified strategy category across the four subgroups. To summarize all the responses to the survey, means and standard deviations were computed for each Likert scale item on the questionnaire. The overall frequency of use of e-mail writing strategy was also calculated. The purpose of this analysis was to identify possible subscale groupings based on the items initially grouped conceptually by category as described previously. In general, high means are considered to be in the range of 3.5 to 5.0, medium 2.5 to 3.4, and low 1.0 to 2.4. The overall frequency of e-mail writing strategy (the overall SIEW mean) was 3.38, which indicated moderately high usage of e-mail writing strategies by this sample. The majority of the subjects (59.1%) were moderate strategy users (M=2.5 to 3.4), 38.9 percent of them were high strategy users (M=3.5 to 5.0), and only 1.9 percent of them were low strategy users (M=1 to 2.4). There were no significant differences between the use of e-mail writing strategies of male (Mean=3.37) and female students (Mean=3.41). Furthermore, no significant differences were found between ethnic groups. Figure 1 shows the distribution of mean scores on students' use of e-mail writing strategies measured by SIEW.

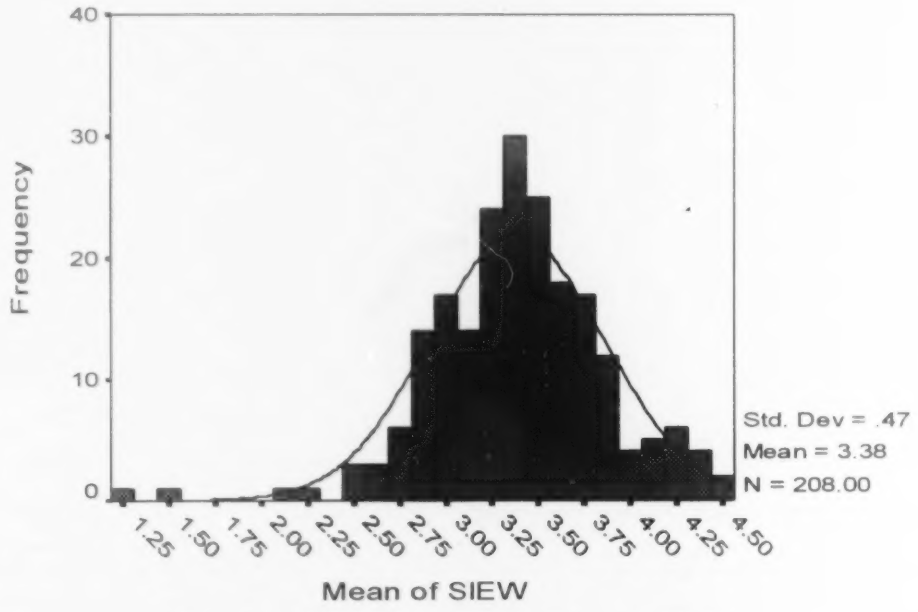

Figure 1. Distribution of Mean Score on SIEW

The SIEW items were divided into four subgroups; (1) cognitive strategies (item 1 to 9), (2) metacognitive strategies (item 10 to 31), (3) social strategies

(item 32 to 40), and (4) affective strategies (item 41 to 50). Table 1 and Figure 2 show the mean of each subgroup and its rank in frequency of the strategy use. It was found that the frequency use of strategy subcategories can be divided into two groups: high frequency use group (social strategies and metacognitive strategies) and medium frequency use (affective strategies and cognitive strategies). The most frequently used strategies were social strategies (Mean=3.66). The second most frequently used strategies were metacognitive strategies (Mean=3.60), which only has the slight difference of 0.06 in mean. The least frequently used strategies were cognitive strategies (Mean=3.11). The second least frequently used strategies were affective strategies (Mean=3.17) which also only has a difference of 0.06 mean.

TABLE 1

Mean, Standard Deviation and Ranking of SIEW

Strategies	Mean	SD	Rank
Cognitive Strategies	3.11	.56	4
Metacognitive Strategies	3.60	.66	2
Social Strategies	3.66	.68	1
Affective Strategies	3.17	.50	3

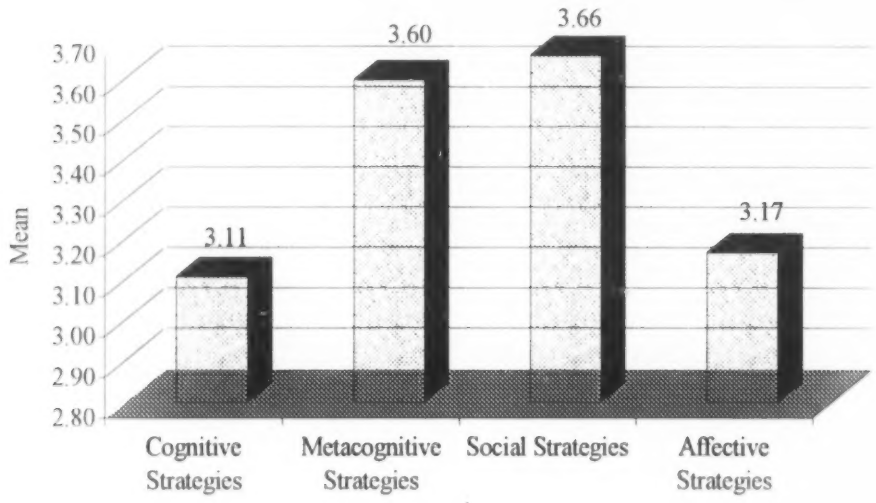

Figure 2. Bar Chart for Mean of Four SIEW Subscales

Closer examination of each SIEW item suggested that the subjects tended to employ certain strategies much more frequently than others do. Table 2 presents the ten most used strategies (20% of all strategies). Among the strategies which were most utilized by the subjects, four out of ten belonged to the social strategy category and most of them ranked very high. Only one out of ten belonged to the cognitive strategy category.

TABLE 2

Most Used Strategies (upper 20%)

Mean	SIEW#	Sub*	Item Description
4.37	36	S	I want other people to understand my e-mail messages as clearly as possible.
4.08	38	S	I try to be polite when writing e-mail messages.
4.05	39	S	I try to write something interesting so that the reader will enjoy my message.
3.99	47	A	I believe writing e-mail messages often will improve my English writing.
3.98	8	C	If I don't know how to say a word, I use a similar one or explain what I mean.
3.96	48	A	I don't enjoy writing e-mail messages. I only write e-mail messages because it is a class requirement.
3.89	16	M	I think about how to express my ideas when I write e-mail messages.
3.89	37	S	I think about making my writing styles suitable to the reader.
3.85	46	A	I feel encouraged when I do well in writing an e-mail message.
3.84	19	M	I try to find a better way to improve my writing.

Note. Sub* = Subcategories

C: Cognitive strategies M: Metacognitive strategies

S: Social strategies A : Affective strategies

The ten least used strategies (lower 20%) are listed in Table 3. The least used strategy was outlining e-mail messages before composing the final draft as a cognitive strategy. Four out of the ten least used e-mail writing strategies belonged to metacognitive strategies.

TABLE 3

Least Used Strategies (lower 20%)

Mean	SIEW#	Sub*	Item Description
2.22	4	C	I outline my e-mail messages before composing the final draft.
2.36	2	C	I keep a vocabulary notebook to record important words and phrases.
2.66	25	M	I write down the outline or main ideas on paper first when the message is very important.
2.98	12	M	I evaluate my progress in English e-mail writing.
3.00	49	A	I try to relax whenever I feel nervous about writing e-mail messages.
3.02	42	A	I am afraid of making mistakes when I write e-mail messages.
3.06	44	A	I worry about my English ability when I write e-mail messages.
3.13	14	M	I revise my first draft when I come up with new ideas during the writing process.
3.14	35	S	I seek out opportunities to exchange e-mail messages with others.
3.17	26	M	When writing e-mail messages, I read the previous sentence(s) before starting a new one to make sure it flows.

Note. Sub* = Subcategories

C: Cognitive strategies M: Metacognitive strategies

S: Social strategies A : Affective strategies

Factor Analysis of the Strategy Inventory for E-mail Writing

Finally, a principal components factor analysis was computed on the SIEW scores for the 208 ESL students to identify the underlying factors that would account for the greatest amount of variation among the students' responses. Fourteen factors with eigenvalues greater than one emerged and accounted for 65.13 % of the total variance (see Appendix II). Six factors were retained based on the review of the related literature and professional judgement. The varimax rotation was performed to simplify each column of the factor matrix.

Table 4 to Table 9 show the factor loadings of each item on the six rotated factors, which account for about 45.45 % of the total variance. The factors are statistically uncorrelated with each other since the Varimax uses an orthogonal rotation. The six factors were summarized in Table 4 through 9. Each Table listed strategy items which correlated highly with the factor (at about or above .400). The loading of each item on the factor was listed on the first column in the order of highest to lowest. The second and third columns showed the SIEW item number and the content of each strategy respectively. The mean of each item and rank of

frequency of use (low, medium, or high) were shown on the fourth and fifth columns respectively.

Table 4 shows Factor 1, which accounted for the greatest amount of variance observed in the sample, and was labeled as planning, organizing, and revising strategies. It represented strategies by which learners use various planning, reviewing, and organizing strategies to facilitate the e-mail writing process. As Table 4 indicated, students in the present study reported high to medium use for planning and arranging strategies.

TABLE 4

Factor 1: Planning, Organizing, and Revising Strategies

Sub*	No	Content	M	Freq*	Loading
M	28	I try to use the new vocabulary or phrases that I learn in my e-mail messages.	3.44	M	.736
M	12	I evaluate my progress in English e-mail writing.	2.98	M	.623
M	21	I try to learn useful vocabulary and expressions that I pick up from e-mail messages.	3.69	H	.616
M	15	I think about how I can utilize the (new) grammar I have learned.	3.17	M	.603
C	4	I outline my e-mail messages before composing the final draft.	2.22	L	.580
M	25	I write down the outline or main ideas on paper first when the message is very important.	2.66	M	.532
M	14	I revise my first draft when I come up with new ideas during the writing process.	3.13	M	.520
C	2	I keep a vocabulary notebook to record important words and phrases.	2.36	L	.470
C	6	I pay attention to the words and the style of native speakers' e-mail writing examples.	3.21	M	.463
M	22	I try to pick up on language errors so that I don't repeat the mistake.	3.39	M	.462 [a]
C	3	I organize my ideas when I compose e-mail messages.	3.44	M	.454
M	31	I try to improve my writing by reading more.	3.62	H	.433
M	19	I try to find a better way to improve my writing.	3.84	H	.426
M	27	I pay attention to the quality of my e-mail messages.	3.44	M	.390 [b]
M	20	I try to write more like native speakers.	3.63	H	.359 [c]

Note. Sub*- C: cognitive strategies M: metacognitive strategies

S: social strategies A: affective strategies

Freq*- 3.5 < H < 5.0 2.5 < M <3.4 1.0 < L <2.4

a Item 22 cross-loaded with Factor 2 with loading .406.

b Item 27 cross-loaded with Factor 3 with loading .385.

c Item 20 cross-loaded with Factor 2 with loading .316.

Factor 2 was characterized as communication strategies. Clustered in this factor were items related to communication purpose such as using similar words and phrases to compensate for the limitation of language, selecting words that could best express the meaning, and using writing styles that were suitable to the audience. As Table 5 shows that students in the present study reported very high use for communication strategies.

TABLE 5

Factor 2: Writing as a Communicative Process

Sub*	No	Content	M	Freq*	Loading
C	8	If I don't know how to say a word, I use a similar one or explain what I mean.	3.98	H	.596
M	24	I try to select words that can best express the meaning I wish to convey.	3.84	H	.581
S	37	I think about making my writing styles suitable to the reader.	3.89	H	.535
M	23	I try to pick up useful expressions for future e-mail writing use.	3.58	H	.534
S	36	I want other people to understand my e-mail messages as clearly as possible.	4.37	H	.484
S	39	I try to write something interesting so that the reader will enjoy my message.	4.05	H	.483
M	18	I try to acquire useful e-mail related skills.	3.32	M	.455 [a]
M	16	I think about how to express my ideas when I write e-mail messages.	3.89	H	.416 [b]
C	1	I focus on the content of my e-mail messages instead of just the grammar.	3.67	H	.386
M	29	I pay attention to the content of my e-mail messages.	3.79	H	.356
C	5	I refer back to the messages that I receive before writing my response.	3.51	H	.333

Note. Sub*- C: cognitive strategies M: metacognitive strategies

S: social strategies A: affective strategies

Freq*- 3.5 < H < 5.0 2.5 < M <3.4 1.0 < L <2.4

a Item 18 cross-loaded with Factor 1 with loading .422.

b Item 16 cross-loaded with Factor 1 with loading .373.

Factor 3 was characterized as monitoring strategies, and it involved strategies focusing on the form and accuracy of language production. These strategies were checking grammar, spellings, meaning, usage, and flow of the e-mail messages. As Table 6 indicates, students in the present study reported high to medium use of monitoring strategies.

TABLE 6

Factor 3: Monitoring (Writing as a Product) Strategies

Sub*	No	Content	M	Freq*	Loading
M	10	I check for grammar errors before I send the e-mail message.	3.25	M	.634
M	11	I check the spelling before I send the e-mail message.	3.53	H	.632
M	13	I reread my e-mail message and check the flow of meaning before I send it.	3.68	H	.602
M	26	When writing e-mail messages, I read the previous sentence(s) before starting a new one to make sure it flows.	3.17	M	.449
C	7	I use a dictionary to look up words when I am not sure about meaning and usage in the e-mail writing process.	3.35	M	.412

Note. Sub*- C: cognitive strategies M: metacognitive strategies

S: social strategies A: affective strategies

Freq*- 3.5 < H < 5.0 2.5 < M <3.4 1.0 < L <2.4

Factor 4 was characterized as affective strategies. All the strategies in this factor belonged to the affective strategy subscale in the original inventory design. Strategies in this factor included encouraging oneself to practice writing e-mail messages, believing in the effectiveness of e-mail writing, and enjoying e-mail writing. As Table 7 indicates, students in the present study reported very high use for affective strategies.

TABLE 7

Factor 4: Affective Strategies

Sub*	No	Content	M	Freq*	Loading
A	45	I encourage myself to practice writing e-mail messages.	3.44	M	.646
A	46	I feel encouraged when I do well in writing an e-mail message.	3.85	H	.651
A	47	I believe writing e-mail messages often will improve my English writing.	3.99	H	.620
A	48	I don't enjoy writing e-mail messages. I only write e-mail messages because it is a class requirement.	3.96	H	.439
A	50	I consider revising e-mail messages to be an unnecessary activity.	3.61	H	.488

Note. Sub*- C: cognitive strategies M: metacognitive strategies

S: social strategies A: affective strategies

Freq*- 3.5 < H < 5.0 2.5 < M <3.4 1.0 < L <2.4

Factor 5 was characterized as social strategies. All the strategies in this factor belonged to the social strategy subscale in the original inventory design. These social strategies included clarifying of problems, learning about other cultures,

seeking out opportunities to exchange e-mail messages, and sharing ideas with people through e-mail exchanges. Table 8 shows that students in the present study reported medium use of social strategies.

TABLE 8

Factor 5: Social Strategies

Sub*	No	Content	M	Freq*	Loading
S	34	If people don't understand my e-mail messages, I try to determine the problem.	3.45	M	.673
S	32	I am willing to learn about other cultures through sharing with people via e-mail.	3.31	M	.610
S	35	I seek out opportunities to exchange e-mail messages with others.	3.14	M	.556
S	33	I share my ideas with people in e-mail messages.	3.38	M	.510
S	40	If I don't understand what people have written in an e-mail message, I ask them to explain.	3.31	M	.420

Note. Sub*- C: cognitive strategies M: metacognitive strategies

S: social strategies A: affective strategies

Freq*- 3.5 < H < 5.0 2.5 < M <3.4 1.0 < L <2.4

Factor 6 was characterized as problem solving strategies. Strategies in this factor included using the student's first language to compensate for the limitation of language proficiency, overcoming e-mail writing anxiety, and avoiding overuse of simple sentences in e-mail writing. As Table 9 indicates, students in the present study reported high-medium use for the problem solving strategies.

TABLE 9

Factor 6: Problem Solving Strategies

Sub*	No	Content	M	Freq*	Loading
C	9	When I write e-mail messages, I write what I want to say in my native language first, and then translate it into English.	3.78	H	.607
A	43	I can overcome my e-mail writing anxiety.	3.42	M	.562
M	17	I try not to overuse simple sentences in e-mail writing.	3.19	M	.479

Sub*- C: cognitive strategies M: metacognitive strategies

S: social strategies A: affective strategies

Freq*- 3.5 < H < 5.0 2.5 < M <3.4 1.0 < L <2.4

Table 10 summarizes the six factors, the average frequency of the use of strategies associated with each factor and the rank order of usage. Among these factors, Factor 2 (communication strategies) was most frequently used by the subjects, closely followed by Factor 4 (affective strategies), whereas Factor 1 (planning, organizing, and revising strategies) was least frequently used. There

are five items cross-loaded in the factor analysis, and all of them are between Factor 1, 2, and 3. It illustrated the independence of each factor. In the following data analysis, in order to be identified as a factor, each factor needed to have more than 3 items. Therefore, only Factor 1 to 5 were included in the analysis. Figure 4 shows the mean score of frequency use of Factor 1 to 5.

TABLE 10

Factors and Frequency

Strategies	Mean	Rank
Factor 1: Planning and arranging strategies	3.21	6
Factor 2: Communication strategies	3.81	1
Factor 3: Monitoring strategies	3.40	4
Factor 4: Affective strategies	3.77	2
Factor 5: Social strategies	3.32	5
Factor 6: Problem solving strategies	3.47	3

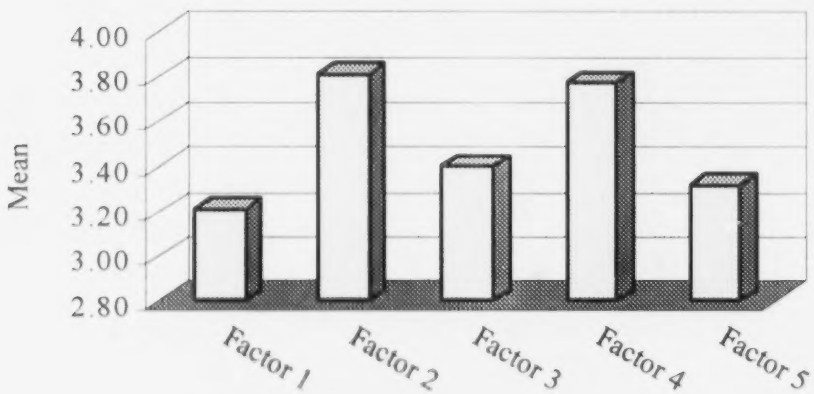

Figure 4. Bar Chart of Frequency Use of Factor 1 to 5

Reliability Test

As has been discussed earlier, items were optimally placed within a set of five scales through factor analysis procedure. A distribution by factor scale of the reliability coefficient based on the final survey of 208 ESL students in the study is provided in Table 11. The reliability coefficients derived from the data with five factors were respectively: .87, .82, .76, .66, and .76. The reported reliability test on SIEW shows adequate internal consistency of .91 with Cronbach alpha coefficient based on the data collected from the above mentioned 208 subjects in the study.

TABLE 11

Reliability Coefficients by Five Factor Subgroups (N=208 students)

Strategies	Reliability Coefficients
Factor 1: Planning and arranging strategies	.87
Factor 2: Communication strategies	.82
Factor 3: Monitoring strategies	.76
Factor 4: Affective strategies	.66
Factor 5: Social strategies	.76

Discriminate Validity

Previous research suggests that the use of language learning strategies should reflect a difference between effective and less effective language learners. That is, effective language learners tend to use more learning strategies than poor learners. One-way ANOVAs on strategy use was conducted by using Bonferoni method and each ANOVA was tested at the .05 level. The results reported significant differences among three different levels of English proficiency and two factors: Factor 2 (communication strategies) and Factor 4 (affective strategies). The ANOVA on the Factor 2 (communication strategies) was significant, $F(2, 205)=3.357$, $p=.037$, $\eta^2=.032$. The ANOVA on the Factor 4 (affective strategies) was also significant, $F(2, 205)=5.497$, $p=.005$, $\eta^2=.051$. The results of the one-way ANOVA supported the hypothesis that English proficiency had a differential effect on the choice of communication strategies and affective strategies in the e-mail writing process. Students in the high English proficiency group reported using more e-mail writing strategies than students in the medium and low English proficiency groups. Students in the medium English proficiency group reported using more e-mail writing strategies than those in the low English proficiency group. Table12 contains the mean and the standard deviation on the dependent variables for the three English proficiency groups.

TABLE 12

Mean and Standard Deviation for English Proficiency on E-mail Writing Strategies

Dependent Variable	E-mail Frequency	N	Mean	SD
Factor 2 Communication Strategies	High	111	3.90	.60
	Medium	40	3.73	.49
	Low	57	3.67	.61
Factor 4 Affective Strategies	High	111	3.87	.71
	Medium	40	3.86	.55
	Low	57	3.50	.80

Post hoc analyses to the univariate ANOVA for the communication strategies and social strategies were conducted to evaluate which level of English proficiency affected the choice of e-mail writing strategies most strongly. Each pairwise comparison was tested at the .05 divided by 3 or .016 level. The results showed that the three levels of English proficiency students did not differ with each other in terms of the use of communication strategies. However, low English proficiency students reported using significantly fewer affective strategies in comparison with high English proficiency students. Medium English proficiency students were not significantly different from either low English proficiency students or English proficiency students. The results fit well with current theories on the language learning strategy use (O'Malley & Chamot, 1990; Oxford, 1989; Green, 1995).

DISCUSSIONS

In summary, the purpose of developing the Strategy Inventory for E-mail Writing (SIEW) was to devise a valid and reliable survey that could be group administered to ESL/EFL students and that would provide a profile of students' use of e-mail writing strategies. The results of the data analysis suggest that the SIEW is an objective and reliable instrument to measure students' use of e-mail writing strategies. The instrument has been used with success by a number of classroom teachers around the world. However, researchers and classroom teachers selecting an instrument designed to measure these strategy use should be aware that the SIEW should not be the sole basis for making important decisions concerning curriculum and instructional design (Sun, 1998).

Second, since the SIEW instrument was written in English, it is possible that some participants did not fully understand the meaning of specific items. Thus, the language used in the instrument may have had an effect upon the results obtained.

For this reason, translation of the SIEW into other languages for the purpose of classroom use might also be important.

Pedagogical Implications

Recommendations regarding the practical pedagogical implications of the research include the following:

Since how students go about learning has a significant effect on their learning outcomes, teachers should become more aware of the e-mail writing strategies that their students are using or not using so that they can orient their teaching methods more appropriately. Thus, language teachers are encouraged to incorporate learning strategy training in their language instruction. The following recommendations regarding learning strategy instruction are made:

a. Diagnosis students' current e-mail writing strategy use.
b. Collect information about students' characteristics such as e-mail literacy, e-mail frequency, e-mail writing styles, attitude toward writing e-mail, and language proficiency.
c. Considering student strategy needs in conjunction with the general course objective, decide which additional strategies should be taught and which of the strategies the students are currently using should be expanded. Take into account students' background characteristics in the decision-making process.
d. Integrate e-mail writing strategy instruction into normal language class work.

Limitations of the Study

Some limitations of the study are as follows: First, the subjects chosen in the current study were limited to ESL students studying in the academic universities in the United States. Therefore, the results of this study might not be generalizable to situations in EFL settings. Replication studies in EFL settings might provide a fresh insight into the e-mail writing strategies area since e-mail writing might provide a stronger incentive and usefulness in countries where students have drastically fewer chances to meet with native speakers of English. It is of interest to know if the differences in the learning environment will have an impact on students' choices in e-mail writing. Using SIEW with a different population would further our knowledge of its reliability and validity across populations.

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APPENDIX I

Strategy Inventory for E-mail Writing (SIEW)

Below is a series of statements about writing strategies in the e-mail settings. Please circle the response (1, 2, 3, 4, 5) that tells how true the statement is in terms of what you actually do when you are writing English e-mail messages. There is no right or wrong answer to these statements.

1. Never
2. Rarely
3. Sometimes
4. Usually
5. Always

COGNITIVE STRATEGIES

1. I focus on the content of my e-mail messages instead of just the grammar.	1	2	3	4	5
2. I keep a vocabulary notebook to record important words and phrases.	1	2	3	4	5
3. I organize my ideas when I compose e-mail messages.	1	2	3	4	5
4. I outline my e-mail messages before composing the final draft.	1	2	3	4	5
5. I refer back to the messages that I receive before writing my response.	1	2	3	4	5
6. I pay attention to the words and the style of native speakers' e-mail writing examples.	1	2	3	4	5
7. I use a dictionary to look up words when I am not sure about meaning and usage in the e-mail writing process.	1	2	3	4	5
8. If I don't know how to express the meaning, I use a similar one or explain what I mean.	1	2	3	4	5
9. When I write e-mail messages, I write what I mean in my native language first, and then translate it into English.	1	2	3	4	5

METACOGNITIVE STRATEGIES

10. I check for grammar errors before I send the e-mail message.	1	2	3	4	5
11. I check the spelling before I send the e-mail message.	1	2	3	4	5
12. I evaluate my progress in English e-mail writing.	1	2	3	4	5
13. I reread my e-mail message and check the flow of meaning before I send it.	1	2	3	4	5
14. I revise my first draft when I come up with new ideas during the writing process.	1	2	3	4	5
15. I think about how I can utilize the (new) grammar I have learned.	1	2	3	4	5
16. I think about how to express my ideas when I write e-mail messages.	1	2	3	4	5
17. I try not to overuse simple sentences in e-mail writing.	1	2	3	4	5
18. I try to acquire useful e-mail related skills.	1	2	3	4	5
19. I try to find a better way to improve my writing.	1	2	3	4	5
20. I try to write more like native speakers.	1	2	3	4	5
21. I try to learn useful vocabulary and expressions that I pick up from e-mail messages.	1	2	3	4	5
22. I try to pick up on language errors so that I don't repeat the mistake.	1	2	3	4	5
23. I try to pick up useful expressions for future e-mail writing use.	1	2	3	4	5
24. I try to select words that can best express the meaning I wish to convey.	1	2	3	4	5
25. I write down the outline or main ideas on paper first when the message is very important.	1	2	3	4	5
26. When writing e-mail messages, I read the previous sentence(s) before starting a new one to make sure it flows.	1	2	3	4	5
27. I pay attention to the quality of my e-mail messages.	1	2	3	4	5
28. I try to use the new vocabulary or phrases that I learn in my e-mail messages.	1	2	3	4	5
29. I pay attention to the content of my e-mail messages.	1	2	3	4	5
30. I don't edit until I finish writing my e-mail messages.	1	2	3	4	5
31. I try to improve my writing by reading more.	1	2	3	4	5

SOCIAL STRATEGIES

32. I am willing to learn about other cultures through sharing with people via e-mail.	1	2	3	4	5
33. I share my ideas with people in e-mail messages.	1	2	3	4	5
34. If people don't understand my e-mail messages, I try to determine the problem.	1	2	3	4	5
35. I seek out opportunities to exchange e-mail messages with others.	1	2	3	4	5
36. I want other people to understand my e-mail messages as clearly as possible.	1	2	3	4	5
37. I think about making my writing styles suitable to the reader.	1	2	3	4	5
38. I try to be polite when writing e-mail messages.	1	2	3	4	5
39. I try to write something interesting so that the reader will enjoy my message.	1	2	3	4	5
40. If I don't understand what people have written in an e-mail message, I ask them to explain.	1	2	3	4	5

AFFECTIVE STRATEGIES

41. I am confident that my writing is understandable.	1	2	3	4	5
42. I am afraid of making mistakes when I write e-mail messages.	1	2	3	4	5
43. I can overcome my e-mail writing anxiety.	1	2	3	4	5
44. I worry about my English ability when I write e-mail messages.	1	2	3	4	5
45. I encourage myself to practice writing e-mail messages.	1	2	3	4	5
46. I feel encouraged when I do well in writing an e-mail message.	1	2	3	4	5
47. I believe writing e-mail messages often will improve my English writing.	1	2	3	4	5
48. I don't enjoy writing e-mail messages. I only write e-mail messages because it is a class requirement.	1	2	3	4	5
49. I try to relax whenever I feel nervous about writing e-mail messages.	1	2	3	4	5
50. I consider revising e-mail messages to be an unnecessary activity.	1	2	3	4	5

APPENDIX II

Factor Analysis: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.097	24.193	24.193	12.097	24.193	24.193
2	3.419	6.838	31.032	3.419	6.838	31.032
3	2.008	4.016	35.048	2.008	4.016	35.048
4	1.993	3.986	39.034	1.993	3.986	39.034
5	1.641	3.282	42.316	1.641	3.282	42.316
6	1.567	3.134	45.450	1.567	3.134	45.450
7	1.441	2.882	48.332	1.441	2.882	48.332
8	1.403	2.806	51.138	1.403	2.806	51.138
9	1.319	2.638	53.776	1.319	2.638	53.776
10	1.259	2.518	56.294	1.259	2.518	56.294
11	1.186	2.371	58.665	1.186	2.371	58.665
12	1.106	2.212	60.877	1.106	2.212	60.877
13	1.081	2.163	63.040	1.081	2.163	63.040
14	1.044	2.089	65.128	1.044	2.089	65.128
15	959	1.918	67.047			
16	911	1.822	68.869			
17	890	1.780	70.649			
18	862	1.725	72.373			
19	820	1.640	74.013			
20	781	1.561	75.574			
21	738	1.477	77.051			
22	700	1.400	78.451			
23	689	1.377	79.828			
24	633	1.265	81.093			
25	604	1.208	82.301			
26	594	1.188	83.489			
27	575	1.150	84.639			
28	553	1.107	85.746			
29	548	1.096	86.842			
30	492	984	87.826			
31	477	955	88.781			
32	469	939	89.719			
33	430	860	90.579			
34	411	822	91.401			
35	396	792	92.193			
36	373	746	92.940			
37	348	697	93.636			
38	343	686	94.322			
39	330	661	94.983			
40	297	594	95.577			
41	286	573	96.149			
42	276	551	96.701			
43	270	540	97.240			
44	251	502	97.742			
45	239	479	98.221			
46	230	460	98.681			
47	184	369	99.050			
48	182	365	99.415			
49	170	339	99.754			
50	123	246	100.000			

Extraction Method: Principal Component Analysis.

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